MAGMA

PCIe Expansion System
User's Manual

ExpressBox^4

PCI Express® to PCI Express® Expansion

Model: EB4-1U

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Preface

Advisories

Five types of advisories are used throughout this manual to provide helpful information, or to alert you to the potential for hardware damage or personal injury. They are **Note**, **Important**, **Caution**, **Warning**, and **Danger**. The following is an example of each type of advisory.

NOTE

Used to amplify or explain a comment related to procedural steps or text.

IMPORTANT

Used to indicate an important piece of information or special “tip” to help you

CAUTION

Used to indicate and prevent the following procedure or step from causing damage to the equipment.

WARNING

Used to indicate and prevent the following step from causing injury.

DANGER or STOP

Used to indicate and prevent the following step from causing serious injury or significant data loss.

Disclaimer: We have attempted to identify most situations that may pose a danger, warning, or caution condition in this manual. However, Magma, Inc. does not claim to have covered all situations that might require the use of a Caution, Warning, or Danger indicator.

Safety Instructions

Always use caution when servicing any electrical component. Before handling the MAGMA PCI-Express Expansion chassis, read the following instructions and safety guidelines to prevent damage to the product and to ensure your own personal safety. Refer to the "Advisories" section for advisory conventions used in this manual, including the distinction between Danger, Warning, Caution, Important, and Note.

Always use caution when handling/operating the computer. Only qualified, experienced, authorized electronics personnel should access the interior of the computer. The power supplies produce high voltages and energy hazards, which can cause bodily harm.

Use extreme caution when installing or removing components. Refer to the installation instructions in this manual for precautions and procedures. If you have any questions, please contact Magma Technical Support.

WARNING

High voltages are present inside the expansion chassis when the unit's power cord is plugged into an electrical outlet. Disconnect the power cord from its source before removing the system cover.

Never modify or remove the radio frequency interference shielding from your workstation or expansion unit. To do so may cause your installation to produce emissions that could interfere with other electronic equipment in the area of your system.

When Working Inside a Computer

Before taking covers off a computer, perform the following steps:

1. Turn off the computer and any peripheral devices.

2. Disconnect the computer and peripherals from their power sources to prevent electric shock or system board damage.

3. Disconnect any telephone or telecommunications lines from the computer.

In addition, take note of these safety guidelines when appropriate:

To help avoid possible damage to systems boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.

When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION

Do not attempt to service the system yourself except as explained in this manual. Follow installation instructions closely.

Protecting Against Electrostatic Discharge

Electrostatic Discharge (ESD) Warning

Electrostatic Discharge (ESD) is the enemy of semiconductor devices. You should always take precautions to eliminate any electrostatic charge from your body and clothing before touching any semiconductor device or card by using an electrostatic wrist strap and/or rubber mat.

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedures to reduce the risk of damage to components. Magma strongly encourages you to follow proper ESD procedures, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

When unpacking a static-sensitive component from its shipping carton, do not remove the component's anti-static packaging material until you are ready to install the component in a computer. Just before unwrapping the anti-static packaging, be sure you are at an ESD workstation or are grounded.

When transporting a sensitive component, first place it in an anti-static container or packaging.

Handle all sensitive components at an ESD workstation. If possible, use anti-static floor pads and workbench pads.

Handle components and boards with care. Don't touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.

Chapter 1 Introduction

General Specifications

The MAGMA 4-Slot PCI Express to PCI Express Expansion System is a general-purpose bus expansion chassis for the Peripheral Component Interconnect Express (PCIe) local bus. The expansion chassis is fully compliant with the PCI Express Local Bus Specification. This system consists of a PCI Express host card, a 1–meter iPass cables, a rack-mount enclosure containing a 4 slot PCIe backplane, a redundant power supply, and cooling fans.

Item	Description
▪ Host Card:	Low Profile PCI Express x8 (8 lane)
▪ Backplane:	4 PCIe slots, expandable to (8) or (12)
▪ Enclosure:	1U Rack-mount (All Steel)
▪ Dimensions:	19" W x 1.75" H x 28" D
▪ Weight:	27 lb
▪ Standard Cable Length:	1-meter iPass
▪ PCI Express Bus Specification	Revision 1.1
▪ PCI Local Bus Specification:	Revision 2.3
▪ PCI Bridge Architecture Spec:	Revision 1.2
▪ Interconnect Bandwidth:	2000 MB/sec or 2 GB/sec or 20 Gbps
▪ Cooling:	Three 15.8 CFM fans One fan in each power supply module
▪ Power Supply:	▪ 250W, 90-264VAC/5 A, 47-63HZ, ▪ 250W Redundant, Hot Swap power supply
▪ MTBF:	30,000 hours
▪ Monitoring	SNMP via Ethernet Audible Alarm
▪ Operating Environment:	0º to 70º C Operating Temperature -55º to 125º C Storage Temperature 0% to 90% Relative Humidity, Non-condensing
▪ Operating Systems:	Windows XP/2000/Server 2003 Mac OS X version 10.4.x + Red Hat Linux 9
▪ Warranty:	30 day money back 1 Year Return to Factory
▪ Available Options:	▪ 3-meter or 7-meter cable

Pre-Installation Information

Before using the MAGMA expansion chassis you should perform the following steps:

Inventory the shipping carton contents for all of the required parts
Gather all of the necessary tools required for installation
Read this manual

Parts List

The following parts are provided:

Item	Qty	Item
1	1	1U 4-slot rack-mount PCIe to PCIe expansion chassis
2	1	Half-height PCI Express host card
3	1	1-meter shielded cable
4	2	U.S. Standard 115V power cord

Tools Required for Installation

In order to complete the installation of the MAGMA expansion system you will need a Phillips-head screwdriver.

Chapter 2 Hardware Installation

The following steps will guide you through the installation of your MAGMA PCI Express to PCI Express Expansion chassis.

Electrostatic Discharge (ESD) Warning

All PCIe cards are susceptible to electrostatic discharge. When moving PCIe cards, it is best to carry the cards in anti-static packaging. If you need to set a PCIe card down, be sure to place it inside or on top of an anti-static surface. For more information, see "Protecting Against Electrostatic Discharge" in the Preface.

WARNING

High voltages are present inside the expansion chassis when the unit's power cord is plugged into an electrical outlet. Disconnect the power cord from its source before removing the enclosure cover. Turning the system power off at the power on/off switch does not remove power to components. High voltage is still present.

CAUTION

Before touching anything inside the enclosure, move to an ESD station and follow proper ESD procedures. Failure to do so may result in electrostatic discharge, damaging the computer or its components. For more information, see "Protecting Against Electrostatic Discharge" in the Preface.

STOP

If your MAGMA expansion chassis was not purchased directly from Magma, Inc., you must check to ensure that it doesn't contain any pre-installed PCIe cards.

Check the rear side of the chassis to see if any PCIe cards are visible in the slots. If you see a PCIe card, you should continue installation using instructions provided by your dealer. If no separate instructions are available, remove the cover by using instructions in Chapter 4 Install Cards and Drives. Then remove the card(s) as normal. If no PCIe card is visible, then continue with the cable installation.

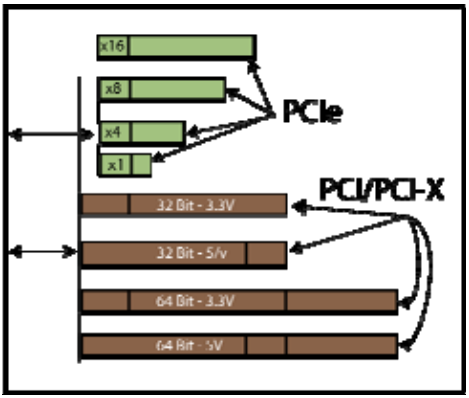
Before you Begin

The dual 250W AC power supplies are auto-switching. This means that it will automatically switch to match whatever source power you are using. Since all products ship with a US/Canadian Standard 125V power cord, you will need to use a locally available power cord for non-US Standard power sources.

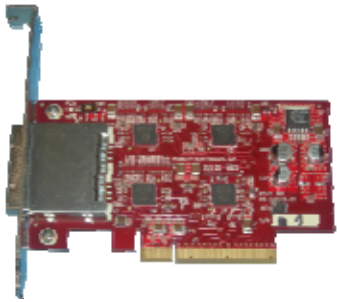
1 Install PCI Express Host Card

Begin the installation of your PCI Express (PCIe) host card by first powering down your computer. Use the procedures for shutting down your operating system and shutting off power to your system provided in your owner's manual or system documentation.

After the host computer is off and all power cords disconnected, remove the cover and insert the PCI Express host card into a vacant x8+ PCIe slot by gently pushing the card until it is firmly seated. Notice that the PCI Express slots are located at a greater distance from the edge of the computer's mother-board than are the standard PCI slots. Then secure the card to the slot with a mounting screw.



The PCIe host card is a “half-height” x8 PCIe card mounted to a “full-height” bracket for convenient mounting in most desktop computer systems. It is also shipped with a low profile card bracket to allow mounting on low profile computer systems.



For low profile case applications, you may need to change the mounting bracket to the low profile bracket that shipped with your system. This is done by removing the screws that hold the card to the bracket. Be sure you are using proper ESD procedures when completing this action.

STOP

YOU MUST ONLY INSTALL THE PCIe HOST CARD INTO A **PCI EXPRESS SLOT**.

Only use cards WITH brackets. This will ensure that your PCIe host card can only be inserted into a PCIe slot. Although PCI Express cards without brackets may fit into conventional PCI slots, you run the risk of damaging the PCI Express host card if you insert it into a PCI slot. Please ensure that your host computer has PCI Express slots and install the host card **only** into a PCI Express slot.

For more information on using PCIe cards, please refer to your computer’s user manual or system documentation.

2 Install Chassis in Rack

Locate a vacant 1U slot in your rack that is within the reach of the one-meter cable that came with your EB4-1U Expansion System. Install the rails in the rack as shown below:

Measure the rack from front to back so you can confirm how long the rail must be to fit properly.

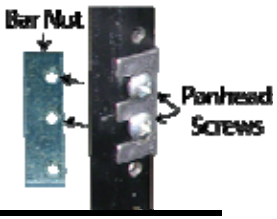
Next, assemble the Slide piece with the end bracket as shown and secure with 2 Panhead screws and locking nut. Ensure the Phillips screw head is located on the "open" side of the Slide pieces as shown.

Tighten finger tight only to allow for minor adjustment during assembly.

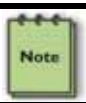
Depending on the depth of your rack you may select either the long or the short end bracket.

Add Screws to Rack Post

Attach 2 Panhead screws into the rack post where you want the chassis mounted. Be sure you have measured accurately to ensure that everything fits in the rack correctly. Leave the screws untightened until after you place the slide rail's fingers between the screws as shown.



If your rack has holes too large for the screws, you can use the Bar Nut to secure your mounting by inserting the Panhead screw through the rack hole and screwing it into the Bar Nut on the reverse side of the rack post, as shown.



NOTE

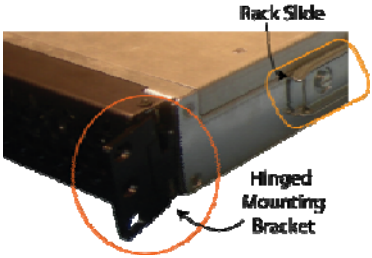
Notice that the holes on the Bar Nut are spaced unevenly to accommodate different racks.

Attach Slide Rail to Rack

Attach to inside of rack with “fingers” pointing “out” and the end bracket to the rear. Secure each Slide Mount with 4 screws as shown below.

Secure the slide rail to the rack with 2 screws to both front and rear posts. After you have secured the slide rail fingers to the rack posts, tighten the 2 screws used to attach the slide rail to the end bracket.

Attach Chassis to Slide Rail

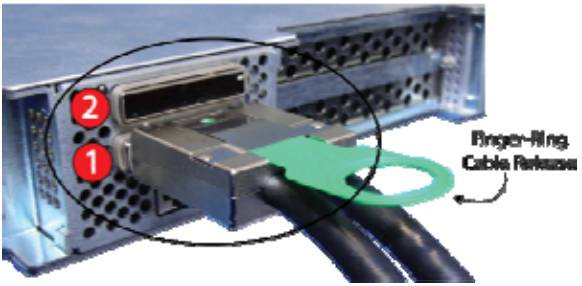


The chassis mounts into the rack from the rear. Before you can attempt to insert the chassis’s rack slide into the half of the rack slide you just mounted to the rack, you must first fold the hinged mounting brackets to a forward position as shown.

Next, insert the chassis into the rack slide and press it forward until the chassis stops. When the chassis is completely inserted into the rack, fold the hinged mounting brackets back against the rack post and secure with 2 screws on each side.

3 Attach Power and Expansion Cables

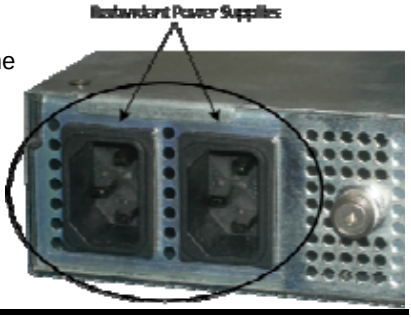
Carefully position the expansion chassis so that the supplied expansion cables will conveniently reach from the host computer to the bottom connector on the back of the chassis.



CAUTION

All cables attached to the expansion chassis must be securely fastened. When you hear a “click,” it is properly secured. If not securely connected, the connectors may cause intermittent or lost connections.

Connect the power cords to the power-in receptacles located at the rear of the enclosure.



NOTE

If at all possible, plug all power cords from the expansion chassis and your host computer into a shared power strip, preferably one that has surge and noise suppression circuitry built into it.

4 Recheck the Installation

Check your installation **before** powering up the MAGMA expansion chassis for the first time. Although the power supply has an over voltage protection device built into it, it may not "trip" in time to fully protect a device that has been improperly connected, or whose power cable has been damaged.

CAUTION

This product is provided with a power supply that automatically adjusts to input voltages between 100 to 240 Vac. A U.S. and Canadian 125 V power supply cord is provided with this product. If using this product outside of the U.S. or Canada, please use locally available power supply cords

5 Applying Power Correctly

Starting Up:

You must apply power to the MAGMA expansion chassis BEFORE you power up your computer. This will allow the higher numbered PCIe buses in the PCIe bus hierarchy to be at a stable state when the host system issues its master power-on bus reset. In systems that perform automatic PCIe bus configuration, this will allow the configuration code to recognize the PCIe bus hierarchy and any attached devices.

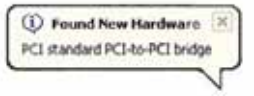
There are three On/Off switches on the front of the chassis, directly behind the front panel, as well as LED indicators to indicate power status. The master power switch is located on the far left and individual power switches are located on each power supply. Turn on the power using the master switch and verify that the green power indicator for each power supply is ON. Turn on individual switches as necessary.

IMPORTANT

These redundant power supplies are hot swappable.

Windows Start Up

As your Windows computer starts up, you will see a small message box pop-up in the lower-right corner of the screen to alert you that Windows has found new hardware.



You are now ready to go. No drivers are needed. Now go to Chapter 3 Verify Installation.

MAC Start Up

Apple MAC OS computers will boot up without any visible indicators that the Expansion System is connected. Go to Chapter 3 Verify Installation.

Shutting Down:

STOP

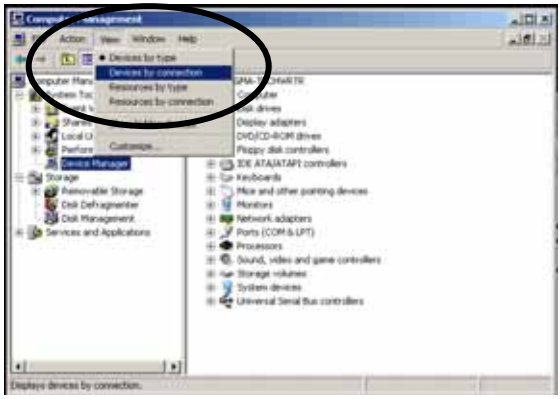
DO NOT TURN OFF THE MAGMA EXPANSION CHASSIS UNTIL YOU HAVE SHUT DOWN YOUR COMPUTER COMPLETELY! It can cause a system lockup and loss of any unsaved data.

When shutting your system down, it is recommended that you first shut down the computer correctly, and then power down the MAGMA expansion chassis to avoid 'computer lock-up' and potential data loss.

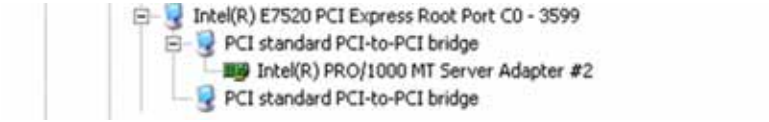
CHAPTER 3 Verify Installation

Windows

To verify a successful installation on Windows, find the '**My Computer**' icon and "right-click" on it. Then select '*Manage*' from the pop-up menu. Next, click on '*Device Manager*' in the leftmost Computer Management window. Finally, click on the *View Menu* and select *View Devices by Connection.*



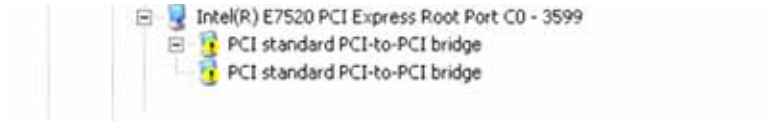
Open ACPI (BIOS) → Open PCIe Bus→ Click the '+' sign several times until your reach a PCI Express Root Port with a PCI Standard PCI-to-PCI Bridge beneath it.


Intel(R) E7520 PCI Express Root Port C0 - 3599
PCI standard PCI-to-PCI bridge
Intel(R) PRO/1000 MT Server Adapter #2
PCI standard PCI-to-PCI bridge

When installed correctly, you will see two "PCIe to PCIe Bridges" below your system's PCIe Controller. Any 3rd Party PCIe cards installed in the chassis will appear below one of the PCIe-to-PCIe bridges.

If everything is OK, then the MAGMA expansion system installation is complete. You can now proceed to Chapter 4 and install your 3rd Party PCIe Cards.

If, however, the installation was unsuccessful, you may not see the PCIe to PCIe Bridge, or it will have a small yellow in front of it.

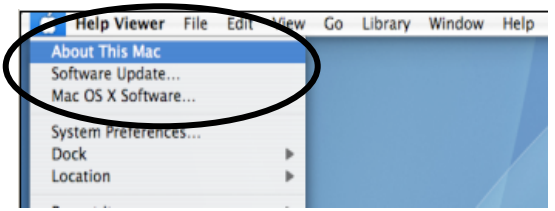


Proceed to Chapter 6 for Troubleshooting installation problems.

Mac OS X

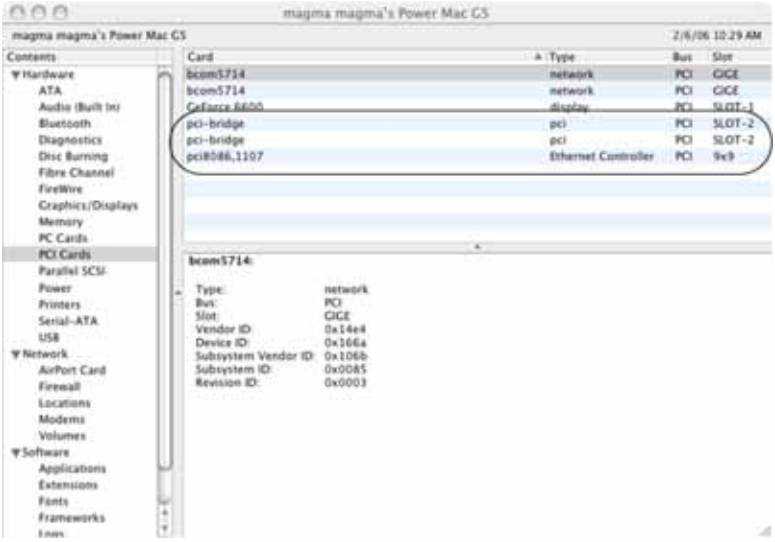
When using Mac OS X no additional software or drivers are needed. As long as you are using Mac OS X Version 10.4 or newer, the operating system should automatically recognize the MAGMA expansion chassis.

Select “About This Mac” under the Apple Icon



Then click the “More Info” button → click on the Devices tab→ you should see a **pci-bridge** device listed under PCIe as shown below:

Any PCIe Cards you install in the expansion chassis will appear behind the **pci-bridge** device.



Mac OS 10.4.x

If any of these devices are not displayed as shown above, you should shut down your system (computer first, then the expansion chassis) and reconnect the cables and the PCIe expansion host card to ensure that you have a solid connection. Then restart the MAGMA expansion chassis followed by the computer. Next, try to verify the installation again, as shown above. If you are still having problems, contact Magma Technical Support at (858) 530-2511.

Chapter 4 Install Cards and Drives

This chapter provides information on how to install 3rd Party PCIe cards into your MAGMA expansion chassis. More details on the installation of individual cards are provided by the card's manufacturer. This chapter is provided as a simple guide to help you install your PCIe cards in the chassis.

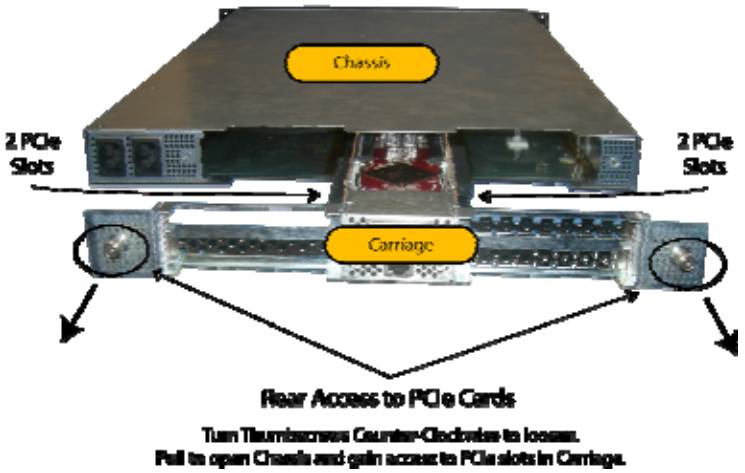
For the purpose of installation, the MAGMA expansion chassis functions exactly as a standard desktop computer chassis. Always follow the manufacturer's instructions for installing their card or hard drive on a desktop computer.

IMPORTANT

We will provide reasonable technical support with 3rd Party PCIe cards. However, if you have verified a successful installation of the MAGMA expansion system (as defined in Chapter 3), but experience difficulty installing your 3rd Party PCIe cards, the card manufacturer should be able to provide the best support.

1 Open PCIe Expansion Chassis

Two (2) thumbscrews secure the PCIe slots in the expansion chassis.



Loosen these screws and pull to slide the PCIe slots out.

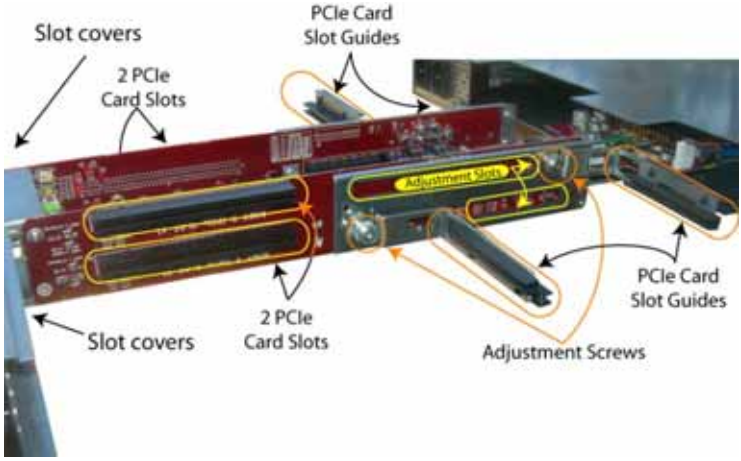
2 Install 3rd Party PCIe Cards

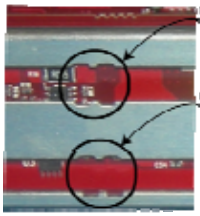
CAUTION

When installing PCIe cards, please ensure that the input current rating specified on the AC input label is not exceeded.

Installing 3rd Party PCIe Cards

The EB4-1U chassis provides space for up to four (4) PCIe cards. Generally, it makes no difference which PCIe slot you use when installing your 3rd Party PCIe cards in the MAGMA expansion chassis, unless specified by the card manufacturer. As can be seen in the following graphic, each of the four PCIe slots has a sliding slot guide to allow you to install any size PCIe card. Simply loosen the adjustment screw for the slot you are using and slide is forward or backward until the card fits snugly. Then tighten the adjustment screw and secure the card to the slot cover using the screw provided.





If your PCIe card is too short for the adjustable card slot guides, you can rotate the slot guard to make if fit. Simply loosen the adjustment screw for the slot you are using and slide the guard to pivot hole, as shown, and remove it. Next, rotate the slot guard 180° and reinsert it. Finally, adjust the card slot guard to fit the card's length.

Be sure to install your PCIe cards following the PCIe card manufacturer's recommendations. Some PCIe card manufacturers recommend that you install their software driver(s) prior to installing the hardware. If this is the case, you should install their driver before you connect and power up the expansion chassis.

Make sure that all PCIe cards are fully seated in their connectors. When correctly seated in its connector, you will notice a firm resistance when you pull up gently on the card. To keep the cards in place, secure them in the enclosure with their retaining screws (supplied with the MAGMA expansion chassis).

IMPORTANT

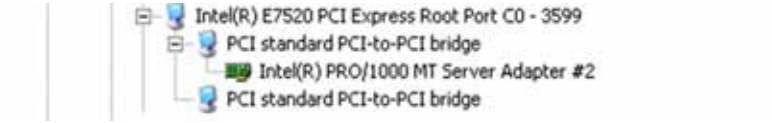
The sheer number of PCIe cards and device drivers available makes it impossible for Magma to fully test and certify all available PCIe cards for use in the MAGMA expansion chassis. Our best advice to you in this regard is to insist on full PCIe Specification compliance from your card and system vendors. Cards and systems should be at least PCIe Specification Revision 1.0 compliant or better. Compliance in your system motherboard, PCIe cards, and console firmware (or BIOS) is your best assurance that everything will install and operate smoothly.

Not all PCIe cards are as "well-behaved" as they should be. Sometimes simply moving a PCIe card that is having a problem to a different slot, or reordering your cards in their slots, will alleviate "behavior" problems.

System Should Be Up and Running

Apply power to the MAGMA expansion chassis first, then power up the computer.

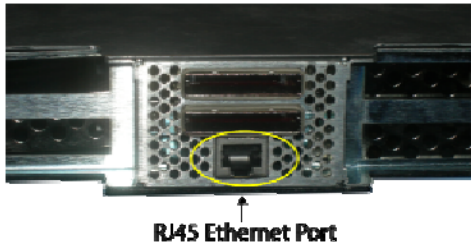
Use the procedures detailed in Chapter 3 to confirm the card installation(s) in the Windows Device Manager or Apple System Profiler. When everything is functioning correctly, your Windows Device Manager should look something like this:


Intel(R) E7520 PCI Express Root Port C0 - 3599
PCI standard PCI-to-PCI bridge
Intel(R) PRO/1000 MT Server Adapter #2
PCI standard PCI-to-PCI bridge

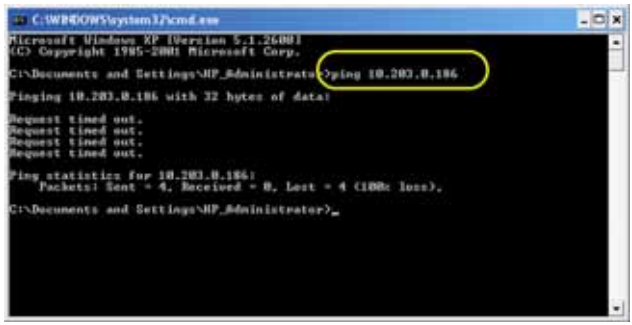
If you discover that any of your 3rd Party PCIe cards contain a you have a problem with that card. Refer to Chapter 6 Troubleshooting for further guidance.

4 Configuring SNMP

To ensure that you can successfully monitor your new system, you will need to connect it to your network using a standard RJ45 Ethernet Cable. Connect one end of the cable to the RJ45 port, located on the rear of the chassis, and the other end to your network.



Before the cable is connected to your network, open a DOS window on a computer connected to the network by clicking on the **Start** button and then clicking the **Run** icon. Your first task is to ensure that the EB4-1U's default IP address does not already exist on your network. To do this, type **ping 10.203.0.186** and press **Enter**.


C:\WINDOWS\system32\cmd.exe
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings\HP_Administrator>ping 10.203.0.186
Pinging 10.203.0.186 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 10.203.0.186:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\Documents and Settings\HP_Administrator>

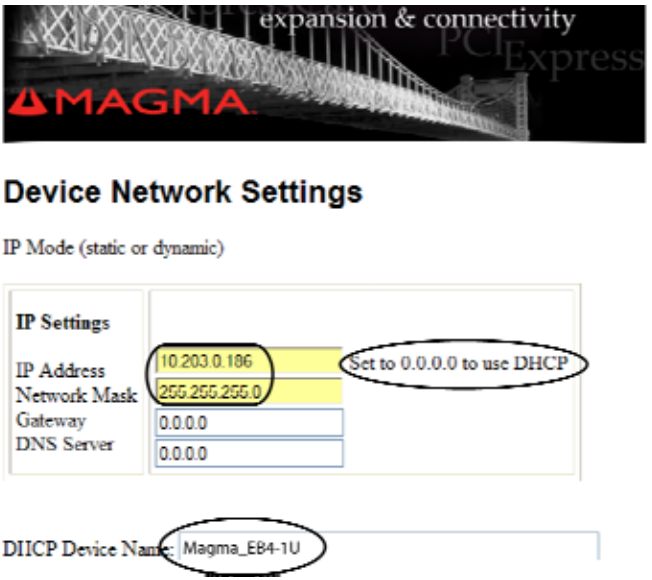
If you do not find another device on your network with the same IP address, you will receive a *Request timed out* message as shown in the above graphic. If the default IP address is not found, you can finish connecting the Ethernet Cable to your network and continue.

If you do not perform this Ping Test, and the EB4-1U's default IP address is being used by another device on the network, you will not be able to find the EB4-1U to configure your SNMP services. In this case, you will have to locate the device with this IP address and change, or temporarily disable, its IP address before you can configure the EB4-1U's SNMP settings.

An alternative method is to configure the EB4-1U off the network by using a cross-over cable and only add the EB4-1U to the network when the IP address conflict has been resolved. (See the following section on Configure Network Settings.)

Configure Network Settings

Once it is safe to add the EB4-1U chassis to the network, open your browser and enter the IP address in the URL window and press **Enter**. The following browser window will open up



To change the IP address, enter the new static IP address in the IP Address field. Enter the new subnet mask in the Network Mask field. Enter the IP addresses for the Gateway and the DNS Server in the appropriate fields. Finally, enter the network name of the EB4-1U in the DHCP Device Name field for use when accessing the chassis when DHCP is enabled. If you wish to use DHCP, enter 0.0.0.0 in the IP Address field.

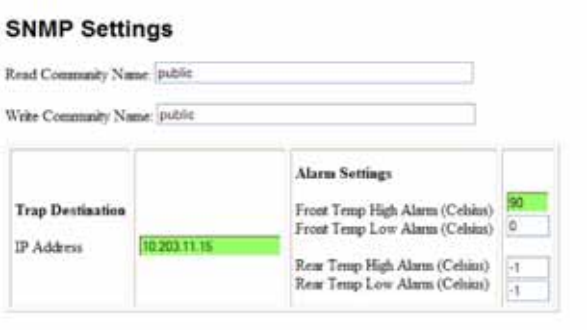
To find the IP address assigned by your DHCP server, look in the DHCP server's list of attached devices for the name you assigned to your EB4-1U chassis. The default name is Magma_EB4-1U.

When you have finished configuring the network settings, you can either configure the SNMP settings as described in the next section, change the default user name and password, or save the current changes by clicking on the **Submit New Settings** button at the bottom of the screen.

Configure SNMP Settings

If you are adding your EB4-1U chassis to an existing SNMP network, or if you are planning to trap SNMP errors, you will need to configure the SNMP settings for use with your SNMP agent.

The default values for the SNMP settings are shown in the following graphic. The EB4-1U chassis monitors two temperature sensors; (one in the front of the chassis and one in the rear of the chassis); three fans; and two redundant power supply modules.

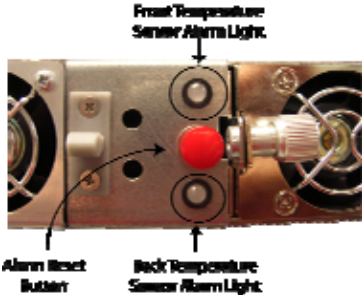


To configure these values for your SNMP network, simply change the default values to match your requirements.

Change the **Read Community Name** and **Write Community Name** fields to match those required by your SNMP network. The default value is *public*.

Change the **Trap Destination IP Address** to the IP address of the computer getting the SNMP data. The default **Trap Destination IP address** is *10.203.11.15*.

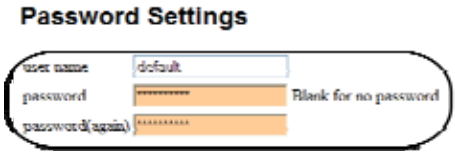
Change the **Alarm Settings** for both the **Front** and **Rear Alarm** settings by entering both a high and low temperature in the appropriate fields. Any time the temperature in the chassis goes above or below these limits, an audible alarm will sound and an Alarm Light will light. The light above the Alarm Reset Button will light whenever the temperature in the front of the chassis exceeds your temperature limits. The bottom light will light whenever the temperature in the rear of the chassis exceeds your temperature limits. Remember to push the Alarm Reset Button to reset and silence the audible alarm.



When you have finished configuring the SNMP settings, you can either configure the network settings as described in the previous section, change the default user name and password as described below, or save the current changes by clicking on the **Submit New Settings** button at the bottom of the screen.

Change User Name and Password

This section allows you to change the default **user name** (*default*) and **password** (*magma*). To change the **user name**, simply enter your new user name in the **user name** field. To change your password, enter your new password in the **password** field. Enter it again in the **password(again)** field. The password in both fields must match before they can be accepted.



Reset to Default Values

You can restore your EB4-1U chassis to the factory default values by pressing and holding the Alarm Reset Button for 10 seconds. When all values have been restored, you will hear two short beeps to confirm the change has been completed.

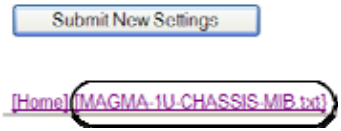
When you have finished changing the default user name and password, you can either configure the network settings or configuring the SNMP settings as described in previous sections, or save the current changes by clicking on the **Submit New Settings** button at the bottom of the screen.

IMPORTANT

The **user name** and **password** fields are case-sensitive.

Configure your SNMP Agent

If you use an SNMP agent to help you monitor your network, you will find all necessary monitoring information in the MIB file available by clicking the link at the bottom of the screen. It is located directly below the **Submit New Settings** button.



After you click on the MIB file link, the information you need to configure your SNMP agent will be displayed on the screen.

Finishing Touches

After your system is working properly, replace any empty slots with slot covers, replace the host computer cover, and the close the expansion chassis carriage.

Chapter 5 Chassis Maintenance

Like all computer systems, you will need to perform some routine maintenance tasks. Some of these include making sure that the air vents in the chassis are clear of obstructions and that the cooling air from the fans flows freely. You should always keep an eye on all cables to make sure they are not damaged and are securely connected. Occasionally, you should open the chassis and slide the carriage out to check for loose cards, and remove any dust build-up.

Always remember to power down your computer and then the expansion system BEFORE you attempt to perform any maintenance tasks.

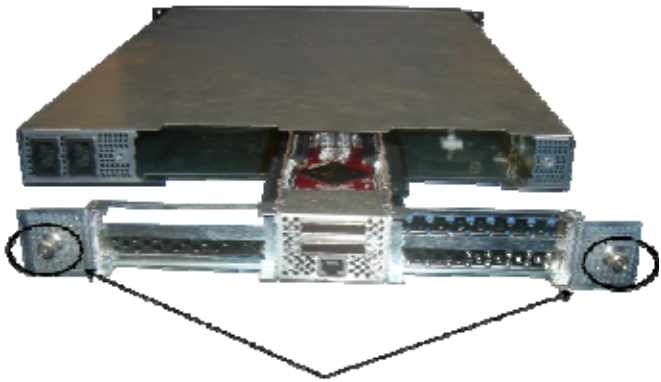
General Chassis Cleaning

The environment where your Magma chassis is operating is a key element to how often you will need to perform a general cleaning of your Magma Expansion chassis. To perform a routine general cleaning of your chassis, you will need the following:

1. Can of compressed air (proper distance, 6 inches)
2. Cotton Swabs
3. isopropyl (alcohol)
4. Anti static wipes
5. Warm water (for filter)
6. Dish soap (for filter)

Do not use a vacuum because they create a lot of ESD

First, loosen the two thumbscrews on the back side of the chassis, and pull out the section with the card slots.



Next, use a can of compressed air from your local computer store to blow out any dust that may have accumulated in the chassis fans.

Be sure to keep the can of compressed air about six inches from the parts being sprayed with air. Pay particular attention to the fans in the chassis and power supply because they are critical to air movement to keeping your chassis cool. Also spray the PCIe slots, and the backplane.

Next, you can use anti static wipes to wipe down any open areas inside and outside of the chassis to remove any remaining dust or dirt. If you have dust or dirt remaining in any “hard to reach area”, such as corners of a fan blade, you can use the cotton swabs, dipped in the isopropyl (alcohol), to gently rub the area clean.

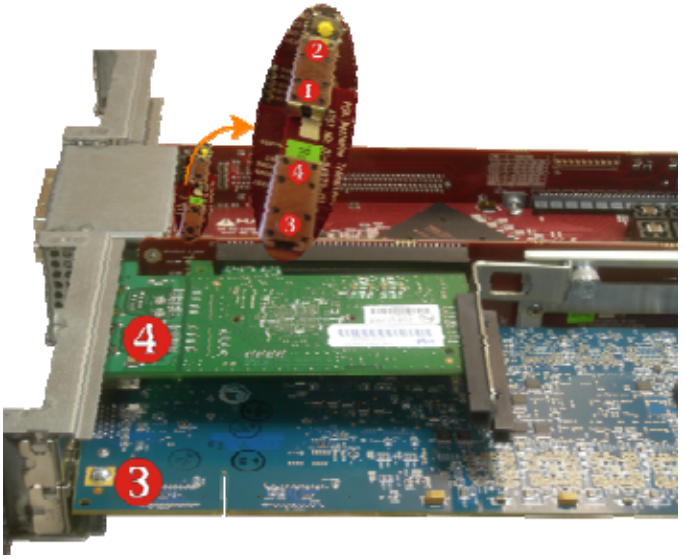
Lastly, if the chassis was extremely dirty, you can remove any installed 3rd Party cards and wipe the PCIe slots with a soft bristle brush (like a toothbrush), dipped in the isopropyl (alcohol), to gently clean each slot. When finished, blow the slots with compressed air from about six inches away until dry.

If your chassis is extremely dirty and you would like professional help with getting it clean, you can contact Magma Support for instructions and costs on shipping the chassis back for cleaning.

Finally, clean the air filter following the instructions later in this chapter. When finished, replace the cover and turn on power to the system.

"Hot-Swappable" PCIe Cards

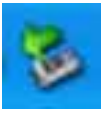
New technology allows you to remove your 3rd Party PCIe cards for maintenance or replacement – without shutting the system down. Each of the four PCIe slots is controlled by a Hot Button. The "inside" buttons control the "top" slots and the "outside" buttons control the "bottom" slots.



Simply press the button for the slot you want to "power-down." Hold the button for a minimum of five (5) seconds and release the button. The power has now been removed from that slot. All other PCIe cards remain fully functional.

Procedure for hot-un-plugging a PCI-Express plug in card:

1. Once system has booted and is stable, an applet on the right hand side of the start menu bar should appear depicting a card with a green arrow above it.



   Double click on the applet.

2. A dialog should appear with the title "Safely Remove Hardware" in the dialog will be a list of devices that may be removed from the system. Within this list will be the cards currently plugged into the chassis.

3. **Select a device and click on the "Properties button".**

4. If the device is currently in the Magma chassis, the location will show "Magma chassis *x* slot *y*". Where *x* identifies the physical chassis and *y* identifies the slot the device is plugged into.

   After verifying that this is the device to be removed, click on the OK button to close the new dialog.

5. The properties dialog should close and the original "Safely Remove Hardware" dialog should remain.

   Click on the Stop button of the dialog.

6. A dialog with the title "Stop a Hardware device" should appear. This device is used to confirm that the user wishes to stop this device.

   Click on the OK button of the new dialog.

7. After a brief period a pop up will appear telling the user that the device may be removed safely, and the device will be removed from the list of the original dialog.

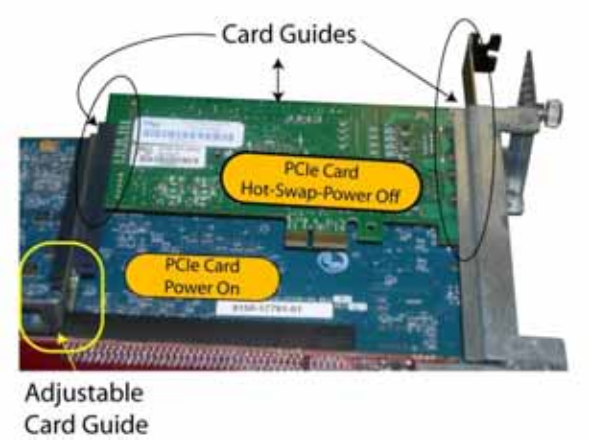
   Press the Attention button that corresponds to the slot where the device is located.

8. A green LED will begin to flash opposite the slot.

   If this is not the slot of the device to be removed, immediately press the button and the LED will stop flashing and remain on, otherwise go to step 8.

9. After 5-6 seconds the LED will stop flashing and turn off completely.

Remove the card and replace it with a new one, if desired at this time, then press the button again.



Notice that the adjustable card guide helps control and support the card that you have powered off while you remove or replace it. This is important because you do NOT want the card being removed to come in contact with another card that continues to have power. Although the chassis is designed to make “Hot Swapping” possible, extreme caution is always necessary during “Hot Swap” activities.

10. The LED should start flashing again.

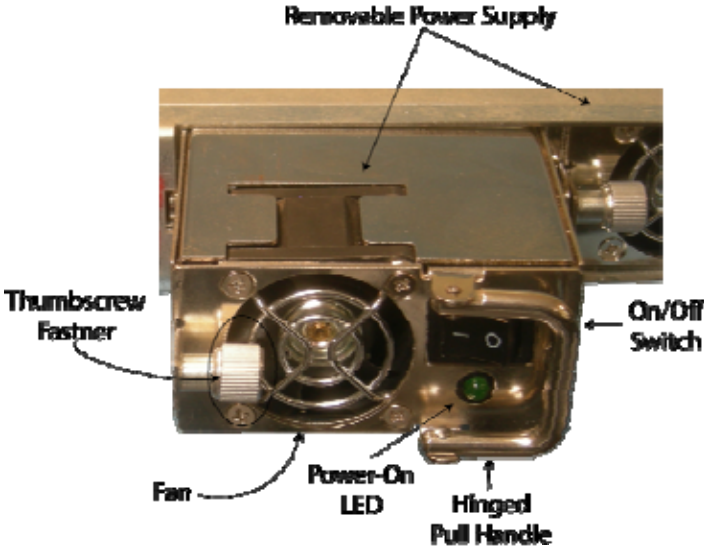
    If power should not be applied to this slot, immediately press the button again and the LED will stop flashing and remain off, otherwise go to step 10.

11. After 5-6 seconds the LED will stop flashing and remain on.

    After a brief period the new device will be recognized by the system, and it should be added to the list in the “Safely Remove Hardware” dialog

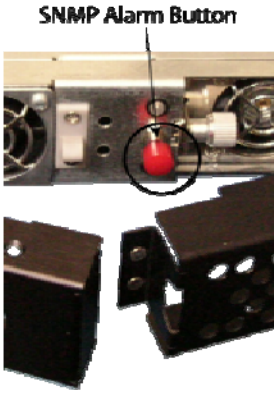
"Hot-Swappable" Power Supply

In spite of regular performance of routine maintenance tasks, some computer systems can experience hardware failures. Fortunately, your investment in the EB4-1U provides you with the ability to easily replace the power supply in the event of power supply failure.



The redundant power supply includes two hot-swappable modules that share the power load requirements during normal operations. Should one module fail for any reason, the power load will be shifted to the other module and sound an audible alarm.

If a power supply fails, an alarm will sound to alert you of the problem. Press the square red button adjacent to the power supply to stop the audible alert.



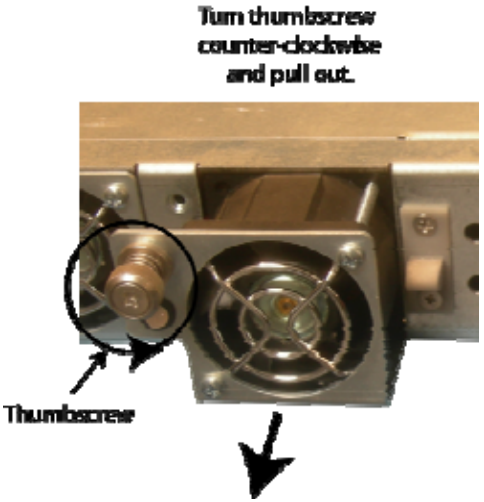
To replace a failed power supply, simply grab the handle, press down on the release lever at the top of the module, and pull. Replace the failed module with a new one and turn on the power to the module using the power switch at the bottom of the module. The power load will again be shared between these two modules.

In order to ensure the safety and efficiency of your expansion system, it is recommended that you keep a spare power supply module on hand – just in case. Protect yourself, keep a spare. Order your spare power supply module from Magma – PN 40-00022-01.

"Hot-Swappable" Fans

The chassis is equipped with three hot-swappable fans. If a fan fails, an alarm will sound to alert you of the problem. Press the square red button adjacent to the power supply to stop the audible alert.

Replacement of a failed fan is as simple as loosening the thumbscrew that secures the fan to the chassis and then pulling the fan from the chassis. Take a new fan and reinsert it into the empty fan housing and then tightening it down with the thumbscrew.



In order to ensure the safety and efficiency of your expansion system, it is recommended that you keep a spare fan on hand – just in case. Protect yourself, keep a spare. Order your spare fan from Magma – PN 40-00024-01.

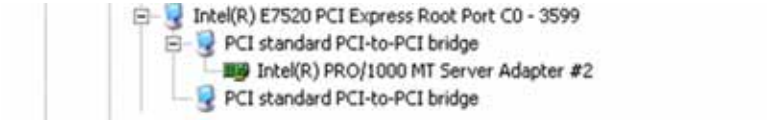
Chapter 6 Troubleshooting

Locate the Problem

If you are having trouble with the MAGMA expansion system, verify that all cards are seated properly and all cables are connected properly. Be sure you followed the instructions in earlier sections of this User Guide. Always remember to power **On** and **Off** correctly when rechecking and testing your installation. If you are still having problems, try these simple troubleshooting steps.

- My Computer Can't Find the PCIe Expansion System
- When Nothing Works
- My PCIe Card Doesn't Work
- SNMP Monitoring

The PCIe to PCIe Expansion System is correctly displayed as a **"PCIe standard PCIe-to-PCIe bridge"** (Windows Device Manager) and as a **"pci-bridge"** (MAC Apple System Profiler). When connected and functioning correctly, this Expansion System will be displayed as follows:


Intel(R) E7520 PCI Express Root Port C0 - 3599
PCI standard PCI-to-PCI bridge
Intel(R) PRO/1000 MT Server Adapter #2
PCI standard PCI-to-PCI bridge

Windows

pci-bridge	pci	PCI	SLOT-2
pci-bridge	pci	PCI	SLOT-2
pci8086,1107	Ethernet Controller	PCI	9x9

MAC

If this is not what you see when you verify your installation, the following troubleshooting steps may help you locate and resolve your installation issues without having to call Technical Support.

My Computer Can't Find the PCIe Expansion System

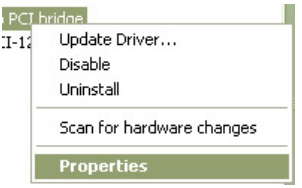
If the expansion system is not visible in your Windows Device Manager or your Apple System Profiler at all, you will need to turn off your computer (first) and then the MAGMA expansion chassis (second) and test all cords and cables to ensure you have everything connected correctly. If everything seems to be connected correctly, and you are sure you have applied power correctly (power up expansion chassis first and then the computer), then try these additional troubleshooting steps:

- Double-check the PCI Express host card to ensure it is in a PCI Express slot and is inserted correctly.
- Try moving the PCIe host card to a different PCIe slot.
- If the expansion system is still not visible after trying all of the above steps, go to Chapter 7 to see about getting additional help.

Windows

If the PCIe to PCIe Bridge is now visible, but contains a in front of it, it has a problem that must be fixed.

To identify this problem, right-click on the line with the and select "Properties" from the pop-up menu.

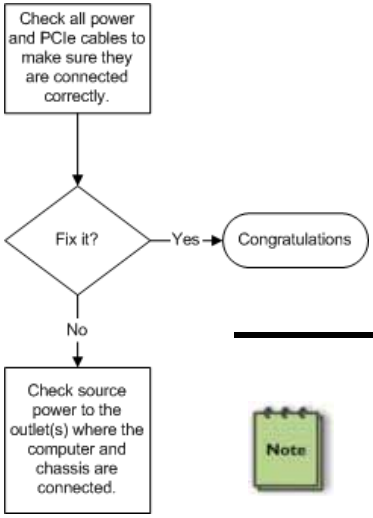


Resolve the identified problem or go to Chapter 7 to see about getting additional help.

MAC

Go to Chapter 7 to see about getting additional help.

When Nothing Works


Check all power and PCIe cables to make sure they are connected correctly.
Fix it?
Yes
Congratulations
No
Check source power to the outlet(s) where the computer and chassis are connected.

The following troubleshooting steps will help you when the computer or chassis won't turn on or "nothing seems to work" correctly:

NOTE

Review Chapters *3 (Verify Installation)* and *4 (Install Cards and Drives)* as necessary to verify that you have a valid installation of the MAGMA expansion system and that you have correctly installed your 3rd Party PCIe card(s) and their associated drivers (as required).

If it powers up OK, but nothing works, check the computer's Device Manager or System Profiler to see if the expansion system has been found. If not found, try the troubleshooting steps for My Computer Can't Find the PCIe Expansion System. If the expansion system is visible, but has a problem, try to resolve the problem (See Note above). If that fails, go to Chapter 7 to see about getting additional help.

My Computer Hangs During Power Up

If your computer "hangs" while being turned on and you can't even start, follow these simple steps to try to fix this problem:

1. Shut off the computer (first) and then the MAGMA expansion system and verify that all cards and cables are installed correctly. Reapply power first to the expansion system and then to the computer.

2. If it still hangs, and you have added one or more PCIe cards, get ready to do some math. Compute the power requirements for each attached card to ensure that you have not exceeded the power capabilities of the expansion system power supply. You can verify the capacity of your power supply by checking the label on the power supply. It will provide all necessary capacity information. If you have exceeded these limits, remove something. If you have not, continue checking.

3. If it still hangs, remove all 3rd Party PCIe cards and try booting up without any cards installed.

    a. If it still hangs, remove the MAGMA PCIe expansion host card from the host computer and try booting up without the MAGMA expansion system attached.

        i. If it boots up OK without the MAGMA expansion system attached, call Magma Technical Support.

        ii. If it still hangs, the problem is in the computer and not with the MAGMA expansion system or the 3rd Party PCIe cards.

    b. If it boots up OK without any 3rd Party PCIe cards installed, try adding only one card and see if it boots up.

        i. If it boots up OK with one card in it, shut it down (in the proper order, of course) and swap cards. Repeat this until all cards have been tested. If they all test OK, then add them back one at a time until you find the combination that doesn't work, or you are running fine. If you find a bad card, call Technical Support. If you don't – congratulations, you fixed it!

        ii. If it still hangs up, try a different card – this one is probably bad (or has driver problems). If the second cards works, troubleshoot the first card. If the second card also fails, call Technical Support.

Power Problems

The ExpressBox4 does not power on.

1. Check to make sure both power cords are connected to AC Power sources in rear of chassis.
    a. Make sure the Power source is powered, i.e. a power strip module must be turned on.
2. Check to make sure both power supplies are set to ON or | on the front of the chassis.
3. Push Power button on front left side of chassis to power up.
    a. You should see two green LED's, one on each power supply.
    b. You should see a green led next to the lightning bolt picture.

PCI Express Expansion Halted On Boot

Host Adapter Problem

1. Make sure the Magma Host Card is properly seated in the host computer in a x8 or x4 PCI Express slot.

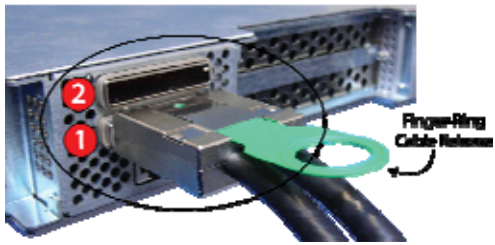
2. Check the DIP switch settings on the Magma Host Card.
    a. The DIP switch setting must be x8 if the host card is inserted into a x8 PCI Express slot.

	Dip Switch x4	Dip Switch x8
PCI Express x4 slot	o.k.	Not o.k.
PCI Express x8 slot	o.k.	o.k.

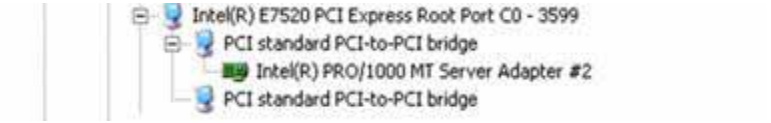
PCI Express Expansion not seen in Device Manager

Expansion Chassis Problem

1. Make sure the iPass cable from the host computer to the chassis is properly installed.
2. The bottom connector of the expansion chassis labeled 1 must be connected to the Magma Host Card.

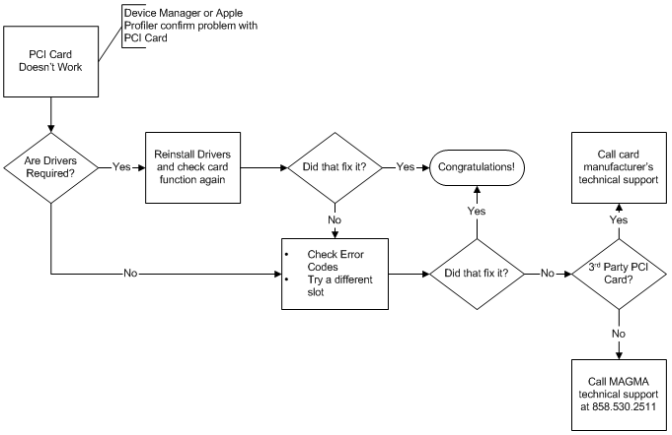


3. You will be able to locate your PCI Express Cards under one of the root ports in your host system. It will show up differently depending on the Operating System.


Intel(R) E7520 PCI Express Root Port C0 - 3599
PCI standard PCI-to-PCI bridge
Intel(R) PRO/1000 MT Server Adapter #2
PCI standard PCI-to-PCI bridge

My PCIe Card Doesn't Work

Follow these simple troubleshooting steps to resolve typical 3rd Party PCIe card problems:



The following additional steps might also help when the above troubleshooting steps fail to resolve your problem:

1. Shut down the computer followed by the MAGMA expansion chassis

2. Remove the PCIe card displaying a problem

3. Replace the "problem card" with a *simple* PCIe card, such as an Ethernet card that has drivers built into the operating system. *(Using this "type of card" will avoid any future questions about drivers possibly being installed incorrectly.)*

4. Turn on the MAGMA expansion chassis, and then turn on the computer.

Windows

5. Next, open the Device Manager (View by Connection selection).

   If the is gone, the problem is with the 3rd Party PCIe card or the card drivers. You should go to the Windows Error Codes section of this chapter to learn how to troubleshoot using error codes.

   If the is still visible, the problem may be with the MAGMA expansion system. Please contact Magma Technical Support for further guidance and/or a replacement product.

   If an error shows on any of the PCIe to PCIe Bridge Connections, call Magma Technical Support immediately.

MAC

5. Next, open the Apple System Profiler and if the PCIe to PCIe Bridge Connections and the 3rd Party PCIe card(s) are now correctly visible.

Support for 3rd Party PCIe Cards

Magma will provide reasonable technical support to with 3rd Party PCIe cards. However, if you have verified a successful installation of the MAGMA PCIe Expansion System (as defined in Chapter 4), but experience difficulty installing your 3rd Party PCIe cards, the PCIe card manufacturer may be able to provide the best support.

IMPORTANT

The MAGMA PCIe Expansion System is designed to function exactly like your desktop computer. This means that you should follow the PCIe card maker's instructions for installation on a Windows or Mac computer as if the expansion chassis WAS the desktop computer. When correctly installed, there is no difference to the operating system, removable cards, or most software.

Windows Error Codes

If you are having a problem with one of your devices, and the Device status box shows a Windows Error Code, refer to the following list of error codes for guidance:

Error Code	Description/Action
10	**This code indicates that there is a problem with the 3rd Party PCIe Card driver.** If necessary, contact the PCIe Card's manufacturer for updated PNP compatible drivers. If all else fails, contact Magma Technical Support for further assistance.
12	**On the Bridge:** If you receive error code 12 on the first PCIe to PCIe Bridge, call Magma Technical Support. **On the PCIe Card**: This usually means the memory, I/O, or prefetch is more than has been allocated. Call Magma Technical Support.
28 (PCIe Card)	The driver for the PCIe Card is not installed on your system. Reinstall the PCIe Card driver following the manufacturer's instructions. If that fails to fix the problem, call the card manufacturer for new drivers.
1	The PCIe host card or expansion chassis are not working correctly. Reinstall the PCIe host card into the computer's PCIe slot and recheck all cable connections. If the error code remains, try another PCIe slot. If you still have the error, call Magma Technical Support.
Other Codes	For all other error codes, call: **On the PCIe to PCIe Bridge:** Magma Technical Support **On the PCIe Card:** Card Manufacturer's Technical Support, after first verifying that the MAGMA expansion system is installed properly.

If you are still having problems, contact Magma Technical Support for more help.

SNMP Monitoring

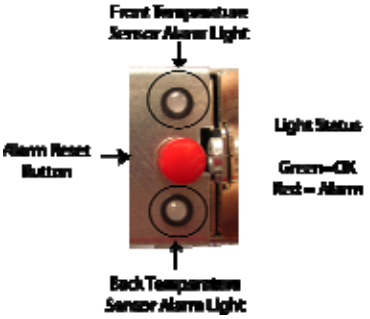
SNMP monitoring is available to help with troubleshooting your EB4-1U chassis. If you are using an SNMP agent to monitor your network, you must first configure your SNMP network with information from the MIB file included with the EB4-1U system.

You must configure your EB4-1U chassis correctly, or it will not be visible to your network. More information on configuring your SNMP settings is available in Chapter 4, Step 4 Configuring SNMP.

Audible Alarms

The EB4-1U chassis is equipped with two temperature sensors. One is located in the front of the chassis and the other is located in the back of the chassis. You can configure the high and low temperature sensor limits for each sensor individually. Information on changing these values is available in the Configuring SNMP section in Chapter 4.

When the temperatures inside the chassis are within their assigned limits, both of the Sensor Alarm Lights will glow green. If the temperature ever exceeds the assigned limits, the Sensor Alarm Light for the sensor detecting the failure will glow red and sound an audible alarm. Press the red Alarm Reset Button to silence and reset the audible alarm.



Chapter 7 How to Get More Help

Frequently Asked Questions (FAQ)

You can visit the MAGMA Technical Support FAQ pages on the Internet at:

www.magma.com/support/

Contacting Technical Support

Our support department can be reached by fax at (858) 530-2733 or by phone at (858) 530-2511. Support is available Monday through Friday, 8:00 AM to 5:00 PM PT. When contacting MAGMA Technical Support, please be sure to include the following information:

1) Name
2) Company Name
3) Phone Number
4) Fax Number
5) Email Address
6) Model Number
7) Serial Number
8) Computer Make
9) Computer Model
10) Operating System and Version
11) Make/Model of PCIe cards in expansion chassis
12) Detailed description of the problem

You can also visit our web site at:

www.magma.com/support/

For a quick response, use the Technical Support and RMA Request Form available in the Support Section of the website. Simply complete the form with all required information. Please make sure that your problem description is sufficiently detailed to help us understand your problem.

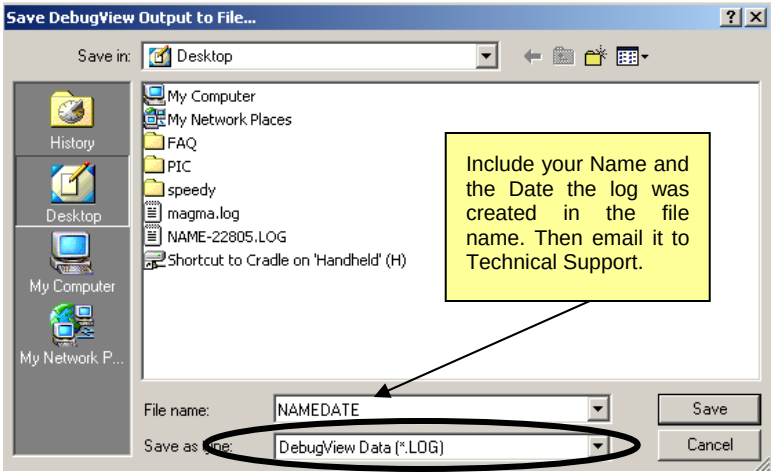
For example: Don't say "Won't boot up." Do say "Tried all the steps in the Troubleshooting Section and it still won't boot up."

For faster diagnosis of your problem, please run the two utility programs described in the following sections and include the diagnostic files they generate with your email.

MAGMA Debug Utility

Occasionally, Magma Technical Support may request Windows users to produce and email a MAGMA debug log file to help them resolve your problem. This file should be emailed to support@magma.com. This file should have a ".log" file extension. To create the *.log file, follow these instructions:

1. Locate a file called **dbgview.exe** on the MAGMA CDROM.
2. Double-click on the file **dbgview.exe**
3. While the **dbgview** screen is open, locate and double-click on a file called **dump.exe** on the MAGMA CDROM.
4. Switch back to the **dbgview** screen, which is now filled with data.
5. Save this file and email to support@magma.com upon request.



Use the "Save as type" drop-down arrow to select a file type of (*.LOG).

PCIScope Software Utility

PCIScope is a powerful tool for Windows users. It was designed by a Germany company called APSoft. This software utility is a valuable resource to explore, examine and debug the PCIe subsystem of your computer. It was made to fit the requirements of the most demanding users, especially engineers, programmers, and system administrators, and to integrate all advanced functions and tools into one product. Please visit www.tssc.de for more information about the capabilities of **PCIScope** and other utilities offered by APSoft.

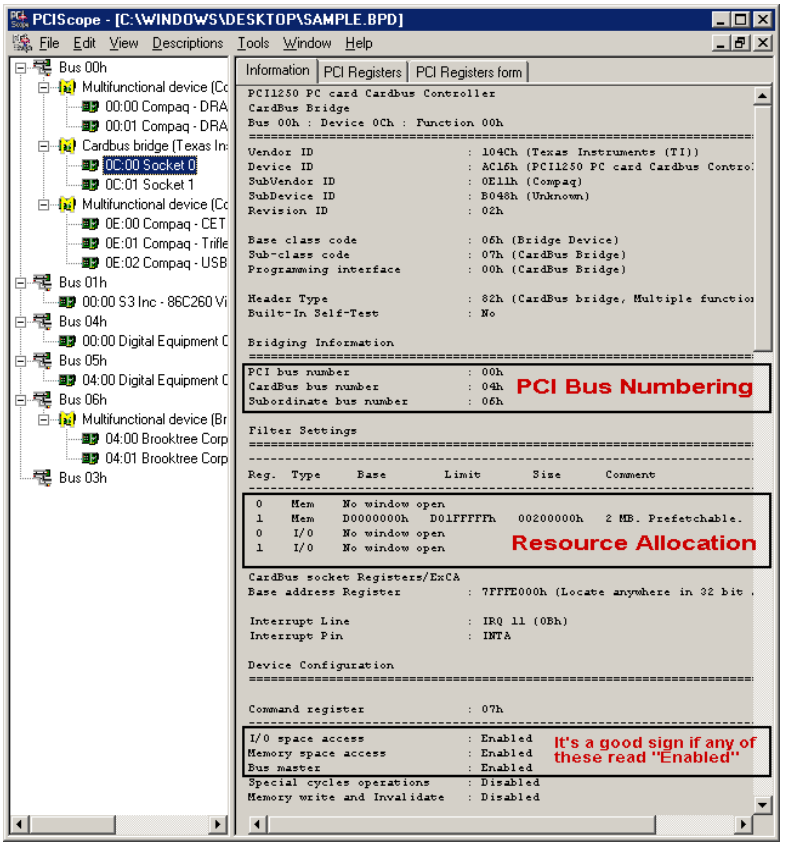
An evaluation version of **PCIScope** is available for download at www.tssc.de. (You can purchase an inexpensive license from APSoft for use beyond the evaluation period.)

PCIScope has proven to be extremely useful when verifying and debugging configurations involving the MAGMA PCIe Expansion Systems under any Windows platform.

PCIScope can provide information to you and our Technical Support Group such as PCIe Bus Numbering, Resource Allocation, and other information that may prove useful when debugging expansion chassis or PCIe card problems.

If you are experiencing problems setting up your system, you should run **PCIScope** before contacting the Magma Technical Support Group.

With the MAGMA expansion chassis powered up and connected to your computer, load and launch the **PCIScope** application. The **PCIScope** Program will be installed on your computer and a window similar to the one shown below will appear. (The example was taken from a Compaq Armada 7400)


PCIScope - [C:\WINDOWS\DESKTOP\SAMPLE.BPD]
File Edit View Descriptions Tools Window Help
Information
PCI Registers
PCI Registers form
Bus 00h
Multifunctional device (Cc
00:00 Compaq - DRA
00:01 Compaq - DRA
Cardbus bridge (Texas In
0C:00 Socket 0
0C:01 Socket 1
Multifunctional device (Cc
0E:00 Compaq - CET
0E:01 Compaq - Trifle
0E:02 Compaq - USB
Bus 01h
00:00 S3 Inc - 86C260 Vi
Bus 04h
00:00 Digital Equipment C
Bus 05h
04:00 Digital Equipment C
Bus 06h
Multifunctional device (Br
04:00 Brooktree Corp
04:01 Brooktree Corp
Bus 03h
PCI1250 PC card Cardbus Controller
CardBus Bridge
Bus 00h : Device 0Ch : Function 00h
Vendor ID : 104Ch (Texas Instruments (TI))
Device ID : AC16h (PCI1250 PC card Cardbus Contro
SubVendor ID : 0E11h (Compaq)
SubDevice ID : B048h (Unknown)
Revision ID : 02h
Base class code : 06h (Bridge Device)
Sub-class code : 07h (CardBus Bridge)
Programming interface : 00h (CardBus Bridge)
Header Type : 82h (CardBus bridge, Multiple functio
Built-In Self-Test : No
Bridging Information
PCI bus number : 00h
CardBus bus number : 04h
Subordinate bus number : 06h
PCI Bus Numbering
Filter Settings
Reg. Type Base Limit Size Comment
0 Mem No window open
1 Mem D0000000h D01FFFFFh 00200000h 2 MB. Prefetchable.
0 I/O No window open
1 I/O No window open
Resource Allocation
CardBus socket Registers/ExCA
Base address Register : 7FFFE000h (Locate anywhere in 32 bit
Interrupt Line : IRQ 11 (0Bh)
Interrupt Pin : INTA
Device Configuration
Command register : 07h
I/O space access : Enabled
Memory space access : Enabled
Bus master : Enabled
It's a good sign if any of these read "Enabled"
Special cycles operations : Disabled
Memory write and Invalidate : Disabled

You should save this data as a file on your computer. Please include your name and date as part of the file name with an extension of ".bpd." Then email this file to support@magma.com if you are experiencing configuration problems.

Returning Merchandise to MAGMA

If factory service is required, a Service Representative will give you a Return Merchandise Authorization (RMA) number. Put this number and your return address on the shipping label when you return the item(s) for service. **MAGMA will return any product that is not accompanied by an RMA number**. Please note that MAGMA WILL NOT accept COD packages, so be sure to return the product freight and duties-paid.

Ship the well-packaged product to the address below:

MAGMA RETURNS DEPT.
RMA # _____
9918 Via Pasar
San Diego, CA 92126
USA

It is not required, though highly recommended, that you keep the packaging from the original shipment of your MAGMA product. However, if you return a product to MAGMA for warranty repair/ replacement or take advantage of the 30-day money back guarantee, you will need to package the product in a manner similar to the manner in which it was received from our plant. MAGMA cannot be responsible for any physical damage to the product or component pieces of the product (such as the host or expansion interfaces for PCIe expansion chassis) that are damaged due to inadequate packing. Physical damage sustained in such a situation will be repaired at the owner's expense in accordance with Out of Warranty Procedures. Please, protect your investment, a bit more padding in a good box will go a long way to insuring the device is returned to use in the same condition you shipped it in. Please call for an RMA number first.

Appendix A Need More Slots?

Multiple PCIe Expansion System Configurations

The PCIe Local Bus Specification defines the PCIe bus as a *hierarchical bus*, where PCIe to PCIe Bridges (PPBs) may be used to add "levels" to the PCIe bus hierarchy. Because hierarchies are *organized systems arranged into different levels*, you can take advantage of this automatic organizing and layering to expand the number of available PCIe slots beyond the number available in your computer's motherboard.

You can easily add two or more Magma expansion systems to your current system in either a "fan-out" or "daisy-chain" configuration. Each of these configurations has advantages and uses. To determine which type of configuration you wish to use, you should first understand a few basic facts:

1. In a desktop computer, the bios enumerates automatically behind PCIe bridges. In the Magma configuration, the bios finds the Magma host card in a PCI Express slot. The bios configures it, and then looks beyond it to find any PCIe cards installed in the expansion chassis. The bios then configures the cards and allocates resources. Empty PCIe slots are ignored during configuration.

In theory, your computer "should" be able to travel across up to 255 PCIe buses to identify and configure all installed PCIe cards. Unfortunately, not all computers are created equal. The 255 PCIe bus limit is actually a theoretical maximum. The practical limit is somewhat lower, but should still be a fairly large number.

In a desktop computer the bus numbers tend to be lower (0, 1, 2, etc.). Once the bios is finished configuring everything and assigning resources, the Operating System starts loading and activates the PCIe cards found.

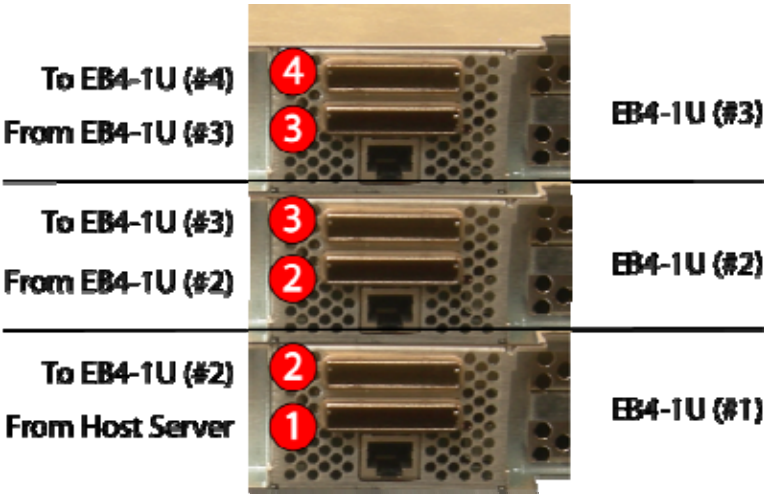
When adding more Expansion Systems to an existing system, be sure to connect and test them "one-at-a-time." This will allow you to quickly resolve any connectivity, or other, issues right at the start. *DO NOT INSTALL any 3rd Party PCIe cards into any system until ALL attached systems are working correctly.*

2. The 4 Slot Magma Expansion System adds four (4) PCI to PCI Bridges to the PCIe Local Bus. These bridges are the communication paths between the PCIe cards and the computer resources. Most computers allow multiple bridges (and thus PCIe buses) to be correctly configured. Some computers, unfortunately, place an arbitrary limit on the number of bridge levels that can be traveled during power-on configuration. Your computer “power-on-software” should be PCI Specification 2.1 compliant in order to effectively use a MAGMA PCIe Expansion System. For "fan-out" and "daisy chained" system configurations, where more than one PCI expansion system is being used, you should count all of the bridge levels to your most deeply nested PCIe bus to determine the maximum number of bridge levels that must be traveled.

3. For easier understanding, the PCIe Local Bus should be viewed as a “Resource Toll road” that runs from the computer CPU (resource home), through the “Toll Booths” (the PCIe bridges), to the “Resource Users” (PCIe Cards). As in the case of a real Toll Road, the more Toll Booths you have to slow down a “nanosecond” for, the longer it will take you (your data) to get from the PCIe Card to the CPU and back again. Under most circumstances the effect cannot even be detected. However, under other conditions, it can be important to know about.

Daisy-Chaining

In the daisy-chain configuration, successive PCIe expansion systems are added to the "end" of the PCIe bus hierarchy, which adds "depth" to the PCIe Local Bus by increasing the number of PCIe Local Bus levels active in the system configuration.



Verify your configuration

Before you start installing your PCIe cards *(refer to Chapter 4 Install Cards and Drives for more information)*, you should confirm that everything is in proper working order. Refer to Chapter 3 Verify Installation for guidance in verifying the proper installation of your Expansion System.

NOTE

Notice that each Daisy-Chained unit appears in the Device Manager in the reverse order of its place in the configuration.

PCIe Card Conflicts

If you determine that one PCIe card is interfering with the operation of another card, first try reorganizing the cards on the motherboard. Moving the cards around can change the order in which the cards are configured by the system during power-on. This will go a long way toward resolving module conflicts.

Power-On Sequence for Advanced Configurations

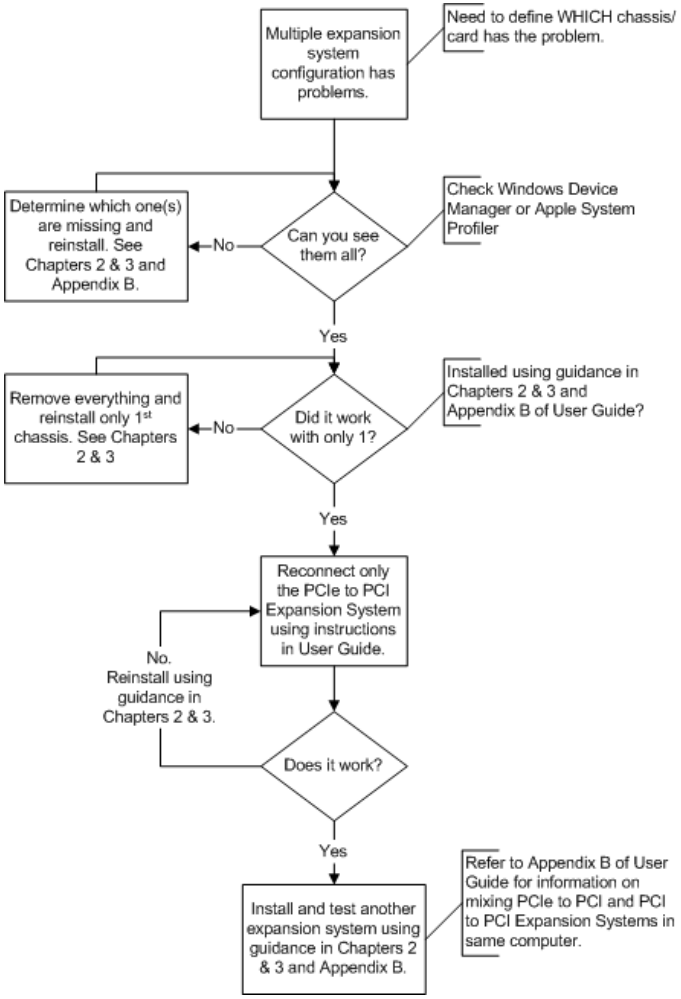
As previously stated in Chapter 2 Hardware Installation, it remains necessary to power up ALL Expansions Systems BEFORE you turn on the computer. This will ensure that your power-on software can read all available PCIe buses and properly configure all installed PCIe cards.

Obviously, the reverse also remains true for shutting your system down. The computer must be shut off BEFORE you attempt to turn off your Expansion System(s).

Troubleshooting Advanced Configurations

When trying to troubleshoot problems with PCIe cards in a multiple expansion system configuration, it is vital to correctly determine the nature of the problem. Therefore, the first task is to identify the card or chassis having a problem by using the Windows Device Manager, or Apple System Profiler. Refer to the first part of this Appendix for more information on identifying hierarchical levels in multiple expansion system configurations.

Remember, Fan-Out configurations can consist of both PCIe to PCIe Expansion Systems and PCIe to PCIe Expansion Systems. Whereas, Daisy-Chain configurations will consist of a PCIe to PCIe Expansion System, followed by one or more PCIe to PCIe Expansion Systems. Only after you have all expansion systems working without any 3rd Party PCIe cards should you attempt to install any 3rd Party PCIe cards.


Multiple expansion system configuration has problems.
Need to define WHICH chassis/ card has the problem.
Can you see them all?
Check Windows Device Manager or Apple System Profiler
No
Determine which one(s) are missing and reinstall. See Chapters 2 & 3 and Appendix B.
Yes
Did it work with only 1?
Installed using guidance in Chapters 2 & 3 and Appendix B of User Guide?
No
Remove everything and reinstall only 1st chassis. See Chapters 2 & 3
Yes
Reconnect only the PCIe to PCI Expansion System using instructions in User Guide.
No. Reinstall using guidance in Chapters 2 & 3.
Does it work?
Yes
Install and test another expansion system using guidance in Chapters 2 & 3 and Appendix B.
Refer to Appendix B of User Guide for information on mixing PCIe to PCI and PCI to PCI Expansion Systems in same computer.

Problems with 3rd Party cards might only be trackable once you have identified the expansion system containing the problem card. Remember, it may be necessary to identify the PCIe/PCI Slot that the Host Interface Card is in before you can properly identify the correct expansion chassis and ultimately the card. Obviously, this is only an issue if you have multiples of the same type of card installed.

Finding the Problem Card

Windows

If you need help to determine which PCIe card, or which expansion chassis, has the problem, you can “right-click” on the card with the and check the information contained in the “Location:” field.

Look for the “Error Code” in the box in the center of the Properties Window and then go to the Windows Error Code section for information on how to resolve this issue.

MAC

If you have already reinstalled and reseated everything according to instructions in Chapter 2, and the PCIe to PCIe Bridge is still not visible in the Apple System Profiler, call Magma Technical Support.

APPENDIX B Compliance

FCC

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE

The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interferences or to be noncompliant with the appropriate standards for its intended use.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numériqué de la classe A est conformé à la norme NMB-003 du Canada

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives. Magma will not retest or recertify systems or components that have been reconfigured by customers.

Magma, Inc.

PCIe Expansion Products

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Email: support@magma.com • www.magma.com

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